

### REMARKS

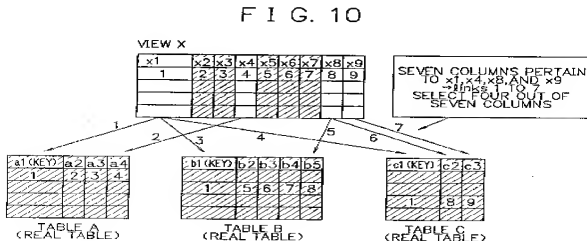
Claims 16-27 are now pending in this application. Reconsideration is respectfully requested.

In the outstanding Office Action, claims 16, 17, 20-23, 25-27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,903,893 (Kleewein) in view of U.S. Patent No. 5,594,898 (Dalal); and claims 18, 19 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kleewein and Dalal as applied to claim 16, and further in view of U.S. Patent No. 5,937,409 (Wetherbee). Reconsideration is respectfully requested.

#### *35 U.S.C. § 103 Claim Rejections*

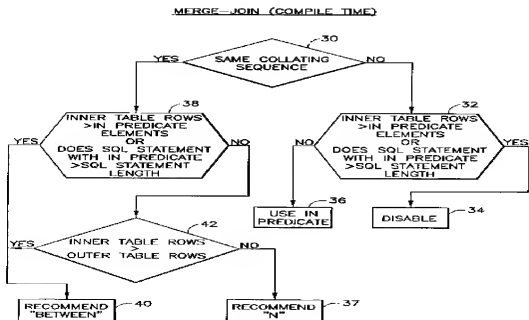
Claims 16, 17, 20-23, 25-27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kleewein in view of Dalal. Reconsideration is respectfully requested.

As shown in **FIG. 10**, in the claimed invention column x1 on view X corresponds to columns a1, b1, and c1 on real tables A, B, and C, column x4 on view X to column a4 on real table A, column x8 on view X to columns b5 and c2 on real tables B and C, and column x9 on view X to column c3 on real table C and the join processing of this embodiment selects one real



column corresponding to each of four columns x1, x4, x8, and x9 including data to be retrieved *so as to minimize the number of joined tables upon search* (emphasis added).<sup>1</sup> That is, there are a total of seven columns (i.e., see links 1 to 7 indicated by the arrows of **FIG. 10**) on the real tables A, B, and C that pertain to four columns x1, x4, x8, and x9 on view X, and only *four columns (links) are selected from these seven columns (links)* (emphasis added).<sup>2</sup> Therefore, the claimed invention can perform high-speed memory search processing without wasting memory capacity by *extracting only necessary columns from tables and excluding redundant columns from tables* in a database system composed of a plurality of tables.

In contrast to the claimed invention, Kleewein discloses an improved join operation is performed between data in at least two tables, with one of the tables stored in a remote database (hereafter "remote table") and another table stored in a local database (hereafter "local table").<sup>3</sup> In particular, Kleewein discloses a database management system (DBMS) procedure **30**, as shown in **FIG. 2** below, that controls merge-join procedure **36** to access data from a remotely



**FIG. 2**

<sup>1</sup> US 2005/0075999 at page 9, paragraph [0145].

<sup>2</sup> *Id.* at page 9, paragraph [0146].

<sup>3</sup> Kleewein at ABSTRACT.

stored table (i.e., an "outer" table) and the merge-join procedure 36 employs either an "IN" predicate or a "BETWEEN" predicate in an SQL statement that is issued to the outer table.<sup>4</sup> However, as can be seen in **FIG. 2** above, Kleewein disclose a merge-join function that is focused on *rows* and not on "columns," as recited in the claimed invention. That is, in contrast to the claimed invention, Kleewein nowhere discloses:

*column exclusion means for excluding columns on other tables which store the same data to be retrieved on the table extracted by said table extraction means from columns to be extracted in subsequent processing (emphasis added).*

Specifically, in the merge-join function of Kleewein, when an external table and an internal table are joined, rows containing the same data as in the columns is set as a condition of joining between **TABLE A** and **TABLE B**. Thus, Kleewein does not disclose exclusion of the columns commonly owned by two tables, as does the claimed invention. Therefore, Kleewein clearly does not disclose and is substantially different from the claimed invention.

In addition, the outstanding Office Action acknowledges deficiencies of Kleewein and attempts to overcome these deficiencies by combining Dalal with Kleewein.<sup>5</sup> However, Dalal cannot overcome all of the deficiencies of Kleewein, as discussed below.

Dalal disclose a method and system for efficiently joining database tables using compact row mapping structures is provided.<sup>6</sup> However, as explained below, it is respectfully submitted that Dalal does not disclose any technique corresponding to column exclusion means.

Dalal explains a join between the Employees table shown in **Fig. 1** and the Orders table shown in **Fig. 2**, in Dalal at column 2, lines 45-57. Both of the Employees table and the Orders table contain an Employee ID column. The Employee ID column is used to join the Employees table and the orders table, as a result, Employees Join Orders Table is formed as shown in **Fig. 3** of Dalal.

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<sup>4</sup> *Id.* at column 4, lines 31-36.

<sup>5</sup> Outstanding Office Action at page 3, paragraph 2.

<sup>6</sup> Dalal at ABSTRACT.

Further, as described in Dalal at column 2, lines 45-57, when a join between the Employees table and the Orders table is restricted by requiring that rows from the Employees table have "NW" in the Region field and that rows from the orders table have an amount in the Order Amount field greater than "\$1,000.00", Restricted Employees Join Orders is formed. Columns included in the Employees table of **Fig. 1** of Dalal and columns included the Orders table of **Fig. 2** are all found in the Restricted Employees Join Orders table of **Fig. 4** of Dalal. That is, it is respectfully submitted that not a single column is deleted. Instead, it is a specific row that is excluded by the "restriction", *not* a specific column.

More specifically, in Dalal, Restricted Employees Join Orders table of **Fig. 4** is formed by joining the Employees table of **Fig. 1** and the Orders table of **Fig. 2** of Dalal, on the purpose of extracting rows having "NW" in the Region field and having an amount in the Amount field greater than "\$1,000.00." Thus, in Dalal the other rows which mismatch the conditions have been excluded. That is, in Dalal, the processing is completed simply by excluding rows which do not agree with the condition.

In contrast to Dalal, the claimed invention discloses a processing method in which necessary data contained in column of each table are purposefully *not* taken in. That is, as can be seen in the example below, when retrieving by combining two tables (e.g., **TABLE A** and **TABLE B**) in background art, two tables are stored in a memory as they are. Typically, data processing is executed using these two tables stored in the memory, wherein the memory needs domains for 50 data samples (i.e., 5x5 for each of the two tables A and B). These data are real data in both tables and are also necessary for retrieval.

For example, in **TABLE A** and **TABLE B** below, col a1 and col b1, col a2 and col b2, col a3 and col b3, and col a4, and col b4 are filled with the same data, respectively. In the claimed invention, when combining the tables containing such common data, after the common data is taken into the memory from one table, the claimed invention does *not* take in the same data on the memory from other table, as shown in **TABLE A + TABLE B**. That is, only column b5 is extracted from **TABLE B** in the memory. Regarding col. b1-b4, col. a1-a4 of **TABLE A** are substituted for them.

**TABLE A**

col a1	col a2	col a3	col a4	col a5
11	21	31	41	51
12	22	32	42	52
13	23	33	43	53
14	24	34	44	54
15	25	35	45	55

col b1	col b2	col b3	col b4	col b5
11	21	31	41	510
12	22	32	42	520
13	23	33	43	530
14	24	34	44	540
15	25	35	45	550

**TABLE B**

**TABLE A + TABLE B**

col a1	col a2	col a3	col a4	col a5	col b5
11	21	31	41	51	510
12	22	32	42	52	520
13	23	33	43	53	530
14	24	34	44	54	540
15	25	35	45	55	550

In this way, the memory domain consumption required to take in data in a memory becomes 6x5, (i.e., 30 data) in the claimed invention. That is, in the claimed invention there is a reduction in the memory consumption as compared to the background art (i.e., from 50 in the background art of Dalal to 30 in the claimed invention) that improves the efficiency of the method of the claimed invention over the applied art and further increases this efficiency over a plurality of tables. That is the claimed invention can avoid wasting memory capacity by providing processing that Dalal does not provide.

In addition, in contrast to the claimed invention, Dalal nowhere discloses:

*column exclusion means for excluding columns on other tables which store the same data to be retrieved on the table*

*extracted by said table extraction means from columns to be  
extracted in subsequent processing (emphasis added).*

That is, though Dalal includes the term "virtual table," Dalal merely discloses a joined table, nowhere discloses a means for creating the virtual table, as recited in the claimed invention as: "column excluding means for excluding columns on other tables which store the same data."<sup>7</sup>

Further, though Dalal includes the term "restrict", what is disclosed by Dalal is merely a retrieval technique of database processing, such that only records restricted by an AND condition of "Region" and "Amount" are extracted from thus-joined two tables.<sup>8</sup> That is, Dalal nowhere discloses, as the claimed invention recites: "column excluding means for excluding columns on other tables which store the same data" that creates a virtual table by excluding columns. Thus, Dalal cannot overcome all of the deficiencies of Kleewein.

Furthermore, independent claim 25 discloses similar limitations to the above-discussed claims in reciting: "means for excluding any duplicative columnar data in the plural distributed databases from the virtual table." Moreover, independent claim 27 discloses similar limitations to the above-discussed claims in reciting:

*excluding, from the created virtual table, columns of the  
second extracted table which duplicates data contents of the first  
extracted table;*

*excluding, from the created virtual table, columns of the  
third extracted table which duplicates data contents of either the  
first or the second extracted table (emphasis added).*

Thus, at least for the reasons discussed above, claims 25 and 27 also are not disclosed by Kleewein or Dalal. Therefore, based on the discussion above, it is respectfully submitted that neither Kleewein or Dalal, whether taken alone or in combination, disclose, suggest or make obvious the claimed invention and that independent claims 16, 20, 23, 25 and 27, and claims dependent thereon, patentably distinguish thereover.

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<sup>7</sup> *Id.* at column 1, lines 50-55.

<sup>8</sup> *Id.* at column 2, lines 45-57.

Claims 18, 19 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kleewein and Dalal as applied to claim 16, and further in view of Wetherbee. Reconsideration is respectfully requested.

Claims 18 and 19; and claim 24 ultimately depend upon claim 16 and claim 23, respectively. As discussed above, neither Kleewein or Dalal disclose the claimed invention of claim 16 and claim 23. Thus, at least for the same reasons, neither Kleewein or Dalal disclose the claimed invention of claims 18 and 19; and claim 24.

In addition, the outstanding Office Action acknowledges deficiencies of Kleewein and Dalal and attempts to overcome these deficiencies by combining Weatherbee with Kleewein and Dalal.<sup>9</sup> However, Wetherbee cannot overcome all of the deficiencies of Kleewein and Dalal, as discussed below.

Wetherbee discloses a relational mapper supports the storage of objects from an object oriented environment in one or more relational databases.<sup>10</sup> However, in contrast to the claimed invention, Wetherbee nowhere discloses:

*column exclusion means for excluding columns on other tables which store the same data to be retrieved on the table extracted by said table extraction means from columns to be extracted in subsequent processing (emphasis added).*

Thus, Wetherbee cannot overcome all of the deficiencies of Kleewein and Dalal, as discussed above. Therefore, it is respectfully submitted that none of Kleewein, Dalal or Wetherbee, whether taken alone or in combination, disclose, suggest or make obvious, the claimed invention and that claims 18, 19 and 24, and claims dependent thereon, patentably distinguish thereover.

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<sup>9</sup> Outstanding Office Action at page 7, paragraph 2.

<sup>10</sup> Wetherbee at ABSTRACT.

***Conclusion***

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 21776-00033-US2 from which the undersigned is authorized to draw.

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